ABSTRACT

A system for transmitting into a shared medium includes a processor, a transmitter, and a receiver. The processor is coupled to the transmitter for transmitting in a manner, at a time, and at a power level as directed by the processor. The processor determines from cooperation with the receiver the number of transmitters expected to be sharing the medium at a future time when transmitting is desired; prescribes a total power for a plurality of transmissions; and prescribes a maximum power for individual transmissions of various types. As implemented for air traffic collision avoidance, a suitable total power for MODE S interrogations transmitted by a TCAS unit on the host aircraft and a suitable power level for individual interrogation transmissions are set according to the detected number of operational TCAS in the airspace, the detected or reported number of members in a flight formation that includes the host aircraft, the altitude of the host aircraft, and the distances from the host aircraft to other members of the flight formation. Other implementations adjust receiver sensitivity, for example, increasing the minimum trigger level (MTL) for detecting interrogations and squitters. With decreased receiver sensitivity, continued use of limited transmission power levels improves system reliability and decreases interference of TCAS with other systems such as ATCRBS. Further implementations revise conventional TCAS interference limiting techniques. Transmission of broadcast messages may be conducted at reduced power or omitted.